

## SPECIFICATION

## TITLE

## SEISMIC ADAPTER

## CLAIM OF PRIORITY

- 5 [0001] This application is a continuation of U.S. Patent application Serial No. 09/844,807, filed April 27, 2001.

## BACKGROUND OF THE INVENTION

- [0002] The field of the present invention is building construction hardware for mounting components such as utilities.
- 10 [0003] Building construction frequently uses steel web joists. Such devices employ two beams. The beams are mutually parallel and spaced apart to create a large moment of inertia for the joist. Cord elements extend at angles between the two so the beams will act as one in bending. Each beam includes a set of two elongate angle elements which are also mutually parallel. The cord elements extend for anchoring to
- 15 between the elongate angle elements which form a cord space to receive the elements. Each angle element includes two legs extending at a right angle to one another, a first leg which is parallel with the first leg of the other angle element to define the cord space and a second leg extending in the opposite direction from the second leg of the other angle element to generally define a plane. The two first legs extend to define parallel
- 20 edges.

[0004] Seismic adapters have been associated with such steel web joists by positioning two flat washers about one of the sets of angle elements. One washer lies in the plane of the second legs such that it extends across the cord space in juxtaposition with the second legs. A second washer is arranged to abut against the parallel edges of the first legs, also extending across the cord space. A threaded stud extends between the washers with a nut or bolt head retaining the first washer in juxtaposition with the second legs. The threaded stud extends beyond the second washer to accommodate attachment hardware. The entire assembly is then clamped to the joist by threading a nut up snug against the attachment hardware and, in turn, the second washer. Although this system is structurally sound, there is some prospect of limited lateral movement of the attachment.

#### SUMMARY OF THE INVENTION

[0005] The present invention is directed to a seismic adapter for attachment to one beam of a steel web joist. An anchor plate having a hole therethrough is positionable across the cord space into juxtaposition with the second legs of the beam. An engagement plate having a hole therethrough abuts up against the parallel edges of the first legs of the beam. A threaded stud extends from the anchor plate to and beyond a hole in the engagement plate. The engagement plate is able to interlock with the first legs.

[0006] In a first separate aspect of the present invention, the engagement plate includes a flat anchor portion and upstanding engagement portions to either side of the flat anchor portion. The engagement portions have distal edges with an engagement

profile for interlocking engagement with the beam. This greatly restricts or eliminates any lateral movement of the adapter.

[0007] In a second separate aspect of the present invention, the engagement plate includes distal edges with tongues extendible to between the parallel legs of the steel web joist beam for interlocking engagement. The tongues may be tapered to accommodate variations in the cord space. Shoulders to either side of each tongue may abut against the edges of the legs.

[0008] Accordingly, it is an object of the present invention to provide an improved seismic adapter. Other and further objects and advantages will appear hereinafter.

## 10 BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Figure 1 is a side view of a seismic adapter placed within a beam of a steel web joist and mounting additional hardware thereto; the view including end views of an anchor plate and an engagement plate.

[0010] Figure 2 is a plan view of the anchor plate.

15 [0011] Figure 3 is a side view of the engagement plate.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0012] Turning in detail to the Figures, one beam of a steel web joist is illustrated as including two angle elements 10 and 12. The angle elements each have a first leg 14 and a second leg 16. The first legs 14 extend in parallel, spaced by a cord space 18 therebetween. The second legs 16 extend in opposite directions from one another, defining a common plane.

[0013] The seismic adapter associated with the steel web joist includes an anchor plate 20 which provides plate means for anchoring by extending across the cord space of the steel web joists into juxtaposition with the second legs 16. The anchor plate 20 is a square flat plate with a centrally formed threaded hole 22. The hole typically is sized to receive a threaded half inch stud.

[0014] An engagement plate 24 includes a flat anchor portion 26 having a hole 28 centrally extending therethrough. Upstanding engagement portions 30 and 32 extend from either side of the flat anchor portion 26 to provide means for interlocking engagement with the first legs 14 of the steel web joist. The upstanding engagement portions 30 and 32 form obtuse angles substantially greater than  $90^\circ$  as illustrated in Figure 3 with the flat anchor portion 26 with all being formed from the same plate. The distal edge of each of the upstanding engagement portions 30 and 32 defines an engagement profile for interlocking engagement. The engagement profile includes a tongue 34 which is tapered inwardly toward the distal extent thereof. Each engagement profile on the distal edge of the upstanding engagement portions also includes shoulders 36 and 38 to either side of the tongue 34. These shoulders 36 and 38 abut against the lower edges of the first legs 14 of the steel web joist. The shoulders 36 and 38 extend further outwardly from the engagement portions the further they are from the tongue 34.

[0015] To draw the anchor plate 20 and the engagement plate 24 together, a stud 40 is shown in threaded engagement with the threaded hole 22 of the anchor plate 20 in Figure 1. The other end of the stud 40, which is shown in this embodiment to be threaded along its length, extends to and beyond the hole 28 in the engagement plate

24. A nut 42 is threaded onto the lower end of the threaded stud 40 to capture an attachment bracket 44 employed for bracing piping 46 and the like.

[0016] In assembly, the stud 40 with the nut 42 in place is extended through the attachment 44 and the engagement plate 24. This assembly is then positioned with the stud 40 extending through the cord space between the legs 14 of the beam of the steel web joist. The stud 40 is then threaded into the anchor plate 20. The nut is next tightened to a torque minimum of 40 ft. lbs. Various adapters may be employed with this system and the orientation of the adapters can vary. The adapter is placed within six inches of the attachment point of any cord element to the upper angle element pair.

10 The taper on the tongue 34 and the extensions of the shoulders 36 provide an interlocking effect to accommodate variations in the cord space of the associated beam of the steel web joist.

[0017] Thus, an improved seismic adapter is disclosed. While embodiments and applications of this invention have been shown and described, it would be apparent to those skilled in the art that many more modifications are possible without departing from the inventive concepts herein. The invention, therefore is not to be restricted except in the spirit of the appended claims.

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